

Framework for Transportation Strategies

**A Policy Paper for the DC Vision and Policy
Framework**

Prepared Jointly By:
District Department Of Transportation
DC Office of Planning
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Overview

This paper has been prepared to provide background information on transportation for the DC Vision and Policy Framework. It is one in a series of eight policy papers analyzing the cross-cutting issues that must be evaluated in planning for the city's future. This paper has been prepared collaboratively by the District Department of Transportation (DDOT), Parsons Transportation Group, and the DC Office of Planning. DDOT is presently updating its 1997 Transportation Vision Plan and therefore has a significant information base on which to develop and evaluate potential strategies.

1. The Context for Transportation Planning in DC

The District of Columbia faces tremendous transportation challenges. The region continues to decentralize, creating longer commutes, increased congestion, and poor air quality. Funding to maintain the existing transportation system, let alone expand the system to meet increased demand, is severely constrained. The funding picture is compounded by a fiscal structure that prevents the District from capturing the revenue needed to maintain basic infrastructure. Much of the transportation demand in the District is generated by suburban residents, whose income the District is not permitted to tax.

While these challenges may seem insurmountable, they also present opportunities. The District has one of the most extensive mass transit systems in the country, densities that support and promote transit use, a growing network of bicycle and pedestrian trails, and a unique system of radial boulevards that distinguish it from all other American cities. Washington's gracious avenues, bridges, and parkways are an integral part of its history and a defining element of its urban form and character. With appropriate strategies in place, these assets can enhance the quality of life in the City and increase Washington's attractiveness while still performing their essential function to move people and goods in and around the city.

The following sections of this paper describe the components of the District's transportation system, including the street and highway network, the mass transportation system, bicycle and pedestrian facilities, rail and truck facilities, and air and water facilities.

A. Street and Highway Network

The District's roadway system consists of 1,153 miles of roadway, 229 vehicular and pedestrian bridges, and approximately 7,700 intersections (of which 1,678 are signalized). The roadways in the District have been categorized by function, ranging from interstates and other freeways, which provide the highest degree of travel mobility, to local streets, which provide the highest level of access to land uses. These various types of roads are described below:

Freeways and Expressways. These roadways, which comprise 54 miles or just under 5 percent of the total roadway miles in the District, are controlled access facilities. Access is via interchange ramps and these roadways typically do not provide direct access to adjacent land uses.

Principal Arterials. These roadways, comprising 92 miles or 8 percent of the District's roadway system, typically serve major activity centers and serve longer trip lengths than the roadway types listed below. The freeways and principal arterials function as the primary commuter routes and form the backbone of the overall roadway system. Freeways and principal arterials, while usually comprising only about 10 percent of total system mileage (they comprise 13 percent in the District), typically carry between 40 and 60 percent of total traffic volumes.

Minor Arterials. Minor arterials account for 173 miles, or 15 percent, of the total roadway system. These roadways serve short to medium length trips, with a greater emphasis on mobility than direct access. In a typical network, minor arterials make up 15 to 25 percent of the mileage and carry 15 to 40 percent of the total traffic.

Collectors. The role of collectors is to move traffic from local streets to the arterials. Collectors will often intersect arterials at signalized intersections. Local roads will intersect collectors at stop signs. Collectors make up 152 miles, or 13 percent, of the District's roadway system.

Local Roads. These roads typically make up the majority of the transportation network as measured by road miles. They carry between 10 and 30 percent of all traffic. The primary role of local roads is to provide access to adjacent land uses, with ideally a very limited role in terms of traffic mobility. Just under 60 percent, or 682 miles, of the District's roadway system is classified as local.

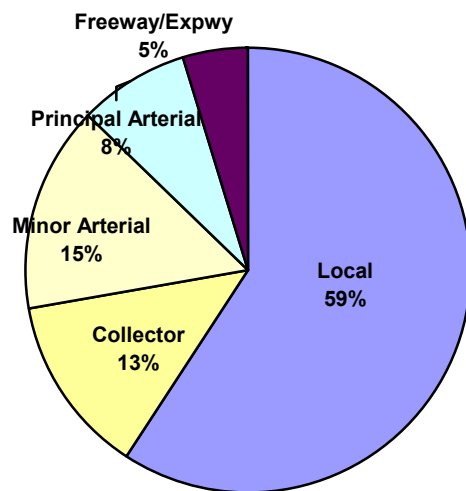


Exhibit 1:
**Roadway Mileage by
Classification**

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It is important to note that, of the 1,153 miles of roadway in the District, 61 miles are under National Park Service control and three miles are under control of the Architect of the Capitol.

Because of their relatively high construction and maintenance cost, bridges represent a substantial portion of the total roadway system investment. The District has 202 roadway bridges that are located on roads classified as collector and above, 12 bridges on the local roadway system, and 15 pedestrian bridges.

With its relatively dense street grid system, the District's roadway system has approximately 7,700 intersections. Approximately 17 percent, or 1,678 intersections, are controlled by traffic signals. Slightly over 500 of these signalized intersections are located within the downtown area; the remainder are located on major arterial corridors.

The District Department of Transportation (DDOT) makes use of various technologies to enhance traffic operations and safety on the roadway system. Major initiatives are ongoing to greatly expand the use of such technologies. These technologies relate primarily to facilitating the collection of real-time information on roadway conditions and operations and to the control of traffic.

The availability of real-time traffic and roadway information allows DDOT to immediately allocate resources to fixing a problem or to re-direct traffic to alternative routes. This information is provided by closed circuit television cameras, weather stations, and vehicle detectors embedded in roadway pavement. Traffic flow on major freeway segments is currently being monitored by eight television cameras. By the end of 2003, 100 cameras will be operational, with a focus on major corridors and potential evacuation routes. DDOT monitors weather conditions such as snow and icy conditions that can adversely affect roadway safety and operations with six weather stations. DDOT also has approximately 600 mid-block loop detectors in place to collect information on vehicle type, speed, and total traffic volume. Because many of these detectors have become inoperable over the years, DDOT is currently rehabilitating them.

The primary means of controlling traffic in the District is its traffic signal system. A major overhaul of the traffic control system is currently underway. This overhaul will also incorporate elements to manage freeway traffic. The control of traffic is supplemented by 20 portable variable message signs. A total of 40 such variable message signs, which can also provide valuable travel information to motorists, will be available by the end of 2003. Six highway advisory radio systems will also be in place by the end of 2003 to further facilitate traffic operations by disseminating of roadway and traffic information and directions to motorists.

Lighting on and near roadways in the District is provided by those agencies that maintain the roads. The Architect of the Capitol maintains approximately 840 streetlights and the National Park Service maintains approximately 1,700. The District government maintains close to 102,000 streetlights, with the majority maintained by DDOT. A small number (under 1,000) are maintained by the Department of Parks and Recreation.

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DDOT estimates that there are 260,000 on-street parking spaces in the District. In addition, there are 140,000 off-street parking spaces, according to officials with the Washington Parking Association. The combined total number of parking spaces is 400,000. The District operates 15,065 parking meters, with 1,500 more scheduled for installation in 2003.

Most off-street parking in the District is located within the Central Business District (CBD). Unlike many cities across the country, the District's off-street parking is entirely private. The District recently lost its only off-street public parking lot at Mount Vernon Square with the construction of the new convention center.

B. Mass Transportation (Bus, Metrorail, Commuter Trains)

Bus Transit. WMATA operates the Metrobus regional bus service. As of December 2002, the WMATA active fleet consisted of 1,456 buses with an average of 42 seats and an average passenger capacity of 71 persons. The average age of the fleet is 8.33 years. The WMATA fleet runs approximately 163,500 miles on an average weekday carrying about 431,000 trips (approximately 55 percent of these trips are within the District). Metrobus operates 157 major routes on 1,442 miles of roadway throughout the metropolitan area. Within the District, Metrobus operates 58 major bus lines on 298 miles of roadway. There are a total of 12,490 bus stops on the regional system.

There are 58 major bus lines in the District that cover 298 miles, or 27 percent of the roadway system. The highest average weekday ridership on these lines ranged from about 200 persons to over 22,000. The total ridership across all 58 lines is approximately 272,600.

Metrobus ridership is considerably higher during the week than on weekends. Seventeen of the 58 major lines do not have weekend service. Based on 2001 data, overall ridership on a Saturday (as measured by unlinked trips) is 45 percent of weekday ridership, and Sunday ridership is 27 percent of weekday ridership.

The District is served by a number of local bus services in addition to Metrobus. In Maryland, these include MTA Commuter Bus, Dillon, Eyre, and Keller Transportation. In Virginia, these include Lee Coaches, National Coach, Quick's, Loudoun County Commuter Bus, and PRTC OmniRide. A number of private bus services also provide circulation within the District for schools, hospitals, and other areas or attractions.

An average of 106 buses depart daily from Greyhound's Washington, DC station on First Street NE, near Union Station. The vast majority of these buses are Greyhound buses, though buses from the three other companies that use the station (Peter Pan, Capital Trailways, and Carolina Trailways) are also included in this total. This equates to 1.1 million passengers per year who either board or alight from an intercity bus in the District. Another 650,000 people travel through the District on intercity buses, for a total passenger volume of approximately 1.75 million people per year. Several blocks separate

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the Greyhound bus station from Union Station, making connections between these modes less efficient than they might be.

Rail Mass Transit. Rail and bus transit service in the District is provided by the Washington Metropolitan Transit Authority (WMATA), which provides service throughout the Washington region. The rail system consists of 103 miles, of which 38.3 miles are located within the District itself. Close to half of the stations on the system (39 of 83 total) are located in the District.

The total WMATA operating fleet consists of 806 rail cars, which have an average age of 17.2 years. The current operating characteristics are shown below in Exhibit 2.

Exhibit 2
Existing Metrorail Operating Characteristics

Line	Weekday rush period train size	Rush period time between trains	Midday and weekend train size	Midday time between trains	Evening time between trains
Red	6 cars	6 min.	4 cars*	12 min.	15 min.
Green	6 cars	6 min.	4 cars	12 min.	20 min.
Yellow	4 or 6 cars	6 min.	4 cars	12 min.	20 min.
Blue	4 or 6 cars	6 min.	4 cars	12 min.	20 min.
Orange	4 or 6 cars	6 min.	4 cars*	12 min.	20 min.

Source: WMATA, 2003

* 6-car trains operate during midday, April through September

** The time between trains during the rush hour period is three minutes where two lines share the same tracks and between Silver Spring and Grosvenor stations on the Red Line.

As the core of the region and the hub of the Metrorail system, much of WMATA's bus and rail transit usage centers on the District. As compared to the region as a whole, District stations also have a disproportionately high amount of total patronage. In May 2001, the total average weekday boardings at all Metrorail stations was 630,000. Of this number, 58 percent or about 362,000 boardings occurred at District stations.

Intercity and Commuter Rail Lines. The District has 27.2 route miles of railroad track, in addition to the tracks of the Metrorail system. This track is owned by two entities. The National Passenger Railroad Corporation (Amtrak) owns a total of 5.5 route-miles. CSX Transportation Inc. (CSXT), a unit of CSX Corporation, owns a total of 21.7 route-miles, including 7.8 miles acquired from Conrail. It should be noted that these numbers are route-miles, not track-miles, and do not reflect multiple tracks on a route.

There continues to be steady growth in the number of people arriving in the District by commuter rail. The two commuter trains companies, the Virginia Railway Express (VRE) and the Maryland Rail Commuter (MARC), together operate five train lines, all of which serve the District.

The MARC Penn Line offers the most frequent train schedule, offering 11 morning (a.m.) inbound and 18 afternoon (p.m.) outbound trains. The MARC Brunswick and Camden

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Lines offer between seven and 11 trains in each direction per day. MARC ridership has increased steadily since 1997.

VRE's Fredericksburg Line has six northbound departures and seven southbound departures. Seats on the line are usually at least 70 percent occupied, with an average occupancy of 78 percent. The Manassas Line has nine daily northbound and southbound departures. Seats on this line are usually about 50 percent occupied on average, but during peak times occupancy is commonly 70 to 90 percent. Like MARC, the number of passengers on the VRE lines have also increased in recent years.

Amtrak runs eight trains regularly into Union Station. The service frequency of these trains is shown in Exhibit 3. In 2001, approximately 3.5 million passengers either boarded or alighted from Amtrak trains at Union Station. The District ranks third in Amtrak station passenger volume, after Philadelphia and New York City.

Exhibit 3
Amtrak Service at Union Station

Train Name	Geographic Coverage	Number of Trains per Day	
		Southbound	Northbound
1 Acela Express/Metroliner	Boston to Washington	18	18
2 Weekend Acela Express/Metroliner	Boston to Washington	9	8
3 Capitol Limited	Boston to Washington	1	1
4 Cardinal	Washington to Chicago	1	1
5 Carolinian & Piedmont	Boston to Jacksonville	5	5
6 Crescent	New York to New Orleans	1	1
7 Silver Service	Boston to Jacksonville	1	1
8 Vermonter	Montreal to Washington	2	2

Source: Amtrak, 2002

C. Bicycles and Pedestrians

Bicycle Network. The District's generally temperate climate is favorable for bicycle travel, and bicycle commuting and recreational travel are prevalent and increasing. The District accommodates bicycle travel on:

- 8 miles of bicycle lanes
- 13 signed bicycle routes (64 miles)
- 34 miles of off-street trails

The major bicycle and pedestrian trails are described in Exhibit 4.

Bicycle parking is provided at an estimated 375 bicycle racks. The majority of these are located downtown and were installed by the two downtown business improvement districts (BIDs). In addition, all Metrobuses in the District now have bicycle racks.

Exhibit 4
Bicycle Trails in the District

Trail	Length (miles)	Owner	Location
Rock Creek Trail	5.5	National Park Service	Rock Creek Park
Chesapeake and Ohio Towpath	4	National Park Service	C&O Canal (Georgetown and Palisades)
Capital Crescent Trail	3.5	National Park Service	Georgetown and Palisades
Fort Circle Hiker/Biker Trail	7.5	National Park Service	Fort Circle
Oxon Cove Trail	1.5	National Park Service	Southeast DC
Anacostia Trail	>1	National Park Service	Anacostia River
National Mall Multi-Use Walkways	1.75	National Park Service	National Mall
Watts Branch	1.9	DC	Northeast DC
Suitland Parkway	2	DC	Southeast DC
Metropolitan Branch Trail	2	DC	Capitol Hill and Northeast DC

Source: Washington Area Bicyclist Association and Toole Design Group, LLC

Pedestrian Travel. With more than 1,600 miles of sidewalk in the District of Columbia, there are sidewalks along the vast majority of roadways in the District. In addition, there are 50 miles of trails that are intended for walking, bicycling, and other forms of non-motorized travel. DDOT is currently in the process of developing a detailed sidewalk and alley inventory.

D. Commercial Traffic

Rail Traffic. CSXT trains running north and south must use the combination of the Capital Subdivision and the Landover Subdivision to get through the Washington, D.C., gateway. About 40 through freight trains are operated each day on this line, notwithstanding the restricted clearance in the Virginia Avenue Tunnel. Other activity on the Landover Subdivision includes approximately six coal trains per day. These are delivered to Benning on the Anacostia Extension, and are moved north to Landover, en route to Bowie, Maryland, for delivery to Pepco generating stations on the Popes Creek Branch.

Thirty-two freight trains per day operate on the Metropolitan Subdivision line, as well as 20 MARC trains and two Amtrak trains. There are 32 freight trains per day on the Capital Subdivision line, along with 20 MARC trains per day. There is no MARC service on either subdivision line on weekends.

Norfolk Southern has rights to use the Landover Subdivision (termed trackage rights), but makes limited use of them. It can move trains from Alexandria to its yard in Baltimore, via the Amtrak Northeast Corridor line, and serves industries along this line. Current activity through the District is limited to intermittent movements of coal trains from the south to Bowie, Maryland, where they are turned over to CSXT for delivery to Pepco.

Taxi. Many residents, workers, and tourists in the District rely on taxi service. Taxis are recognized as a relatively economical and convenient means of travel throughout the District, especially to neighborhoods that are not well served by transit.

Fares are established and posted in each vehicle using the District's Zone System, which determines the fare rate for all travelers. There are approximately 6,000 licensed operating taxis in the city. While there are several large taxi cab companies operating in the District, such as the ABC Cab Company, Checker Cab Association, District Cab Association, Potomac Cab Association, Royal Cab Association, Diamond Cab of DC, Yellow Cab Company of DC Inc., Barwood DC Cab, Capitol Cab Cooperative Association and Washington Cab Association, the majority of the city's taxicabs are individually owned and licensed.

Private operators are not required to submit any information to the DC Taxi Commission on the number of passengers or trips made per period of time. However, they are required to keep daily passengers manifests, and are required to share this information with the commission when a complaint is being investigated. Passenger information is also often shared with the commission for survey purposes.

E. Other Modes (Aviation and Water)

Airports. The District does not have any non-military airports within its boundaries. However, it is served by three commercial airports that are less than an hour away by car or train. There are a number of helicopter landing areas in the District, such as Bolling Air Force Base. Noise from helicopter take-offs, landings, and fly-overs remain a persistent issue in some DC neighborhoods.

The closest commercial airport to the District is Ronald Reagan-Washington National Airport in Arlington, Virginia. This airport, which features limited domestic flights, is accessible from the District by car via the 14th Street Bridge and Route 1 or by Metrorail via the Yellow and Blue Lines.

Also in Virginia is Dulles International Airport, located in on the border between Fairfax County and Loudoun County. This airport is approximately 25 miles west of the District, and is accessible by car via the Roosevelt Bridge, Interstate 66, and the Dulles Access Road. The Dulles Access Road is dedicated for exclusive use by airport users. In addition, Metrobus Route 5A provides service from the District to Dulles Airport. Dulles Airport passengers from the District can also take Metrorail to West Falls Church and then take connecting bus service to the airport.

The third major commercial airport in the Washington region is Baltimore-Washington International Airport in Anne Arundel County, Maryland. This airport is about 25 miles northeast of the District, and accessible by car via the Baltimore-Washington Parkway or Interstate 95. It is also accessible by commuter rail via the MARC Penn Line, which originates at Union Station, and by Amtrak.

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For 2001, National, Dulles, and BWI airports carried approximately 18 million, 13 million, and 20 million passengers, respectively. In 2000, as a region, Washington was ranked sixth in terms of passenger air traffic, after Atlanta, Chicago, Dallas, Los Angeles, and New York.

The year 2001 marked the first year that air passenger traffic declined, largely due to the events of September 11, 2001. However, despite that yearly decline, traffic at the airports has continued to increase over the long term, with 26 percent more passengers in 2001 than in 1995. Passenger traffic at Dulles airport declined by about 10 percent between 2000 and 2001, and traffic at National dropped by about 17 percent after enduring a closure longer than any other airport in the country. BWI was the exception to the rule, registering a traffic increase from 2000 to 2001 of about 4 percent. The airport is a major regional hub for low-cost carrier Southwest, which has been enjoying increased popularity in recent years. Exhibit 5 shows air passenger traffic in the Washington region by airport.

Exhibit 5
Passenger Traffic at Washington-Area Airports

Airport	Number of Passengers		
	1999	2000	2001
Ronald Reagan Washington National	15,185,348	15,888,199	13,265,387
Baltimore Washington International	17,400,000	19,640,000	20,360,000
Washington Dulles International	19,797,329	20,104,693	18,002,319

2. Transportation Trends

A. Congestion Hot Spots and Shifting Travel Patterns

Traffic congestion on the roadway network is not evenly spread throughout the District and is primarily oriented to the radial principal arterial roadways. Exhibit 6 shows year 2000 traffic volumes as band widths: wider bands indicate higher traffic volumes (in Exhibit 6, one-tenth of an inch in band-width represents about 42,000 daily vehicles).

The colors in Exhibit 6 represent an approximation of the level of traffic congestion on the various roadways. The measure of congestion used in this graphic is based on the ratio of traffic volume to capacity (termed the “v/c ratio”). It is important to note that this is a sketch-planning measure of roadway operations and that actual operations can be substantially affected by variables not taken into account in the broad v/c ratio analysis (such as traffic peaking characteristics; composition of the traffic in terms of cars, trucks, and bicycles; parking; buses and bus stops; traffic signal operations; etc.).

Exhibit 6 shows roadway segments operating under capacity, at or near capacity, or over capacity. In general, under capacity conditions indicate adequate traffic operations with levels of congestion that are within the standards accepted in the traffic engineering profession. Near or over capacity conditions indicate potential traffic congestion problems. Specific roadway segments identified as being near or over capacity are shown in Exhibit 7.

These two exhibits provide some indication of potential congestion hot spots. For example, most of the freeway mileage in the District is over capacity, including the I-66 and I-395 bridges. New York Avenue, Connecticut Avenue, South Capitol Street, and Benning Road are also over capacity, as are long segments of 16th Street, Massachusetts Avenue, Benning Road, North Capitol Street, Pennsylvania Avenue and others. Some level of congestion is inevitable in highly urban settings like the District, and in some cases, may even be an indicator of economic success. The challenge is to ensure that congestion does not inhibit the achievement of other basic goals, such as public safety, movement of goods, and improved environmental quality.

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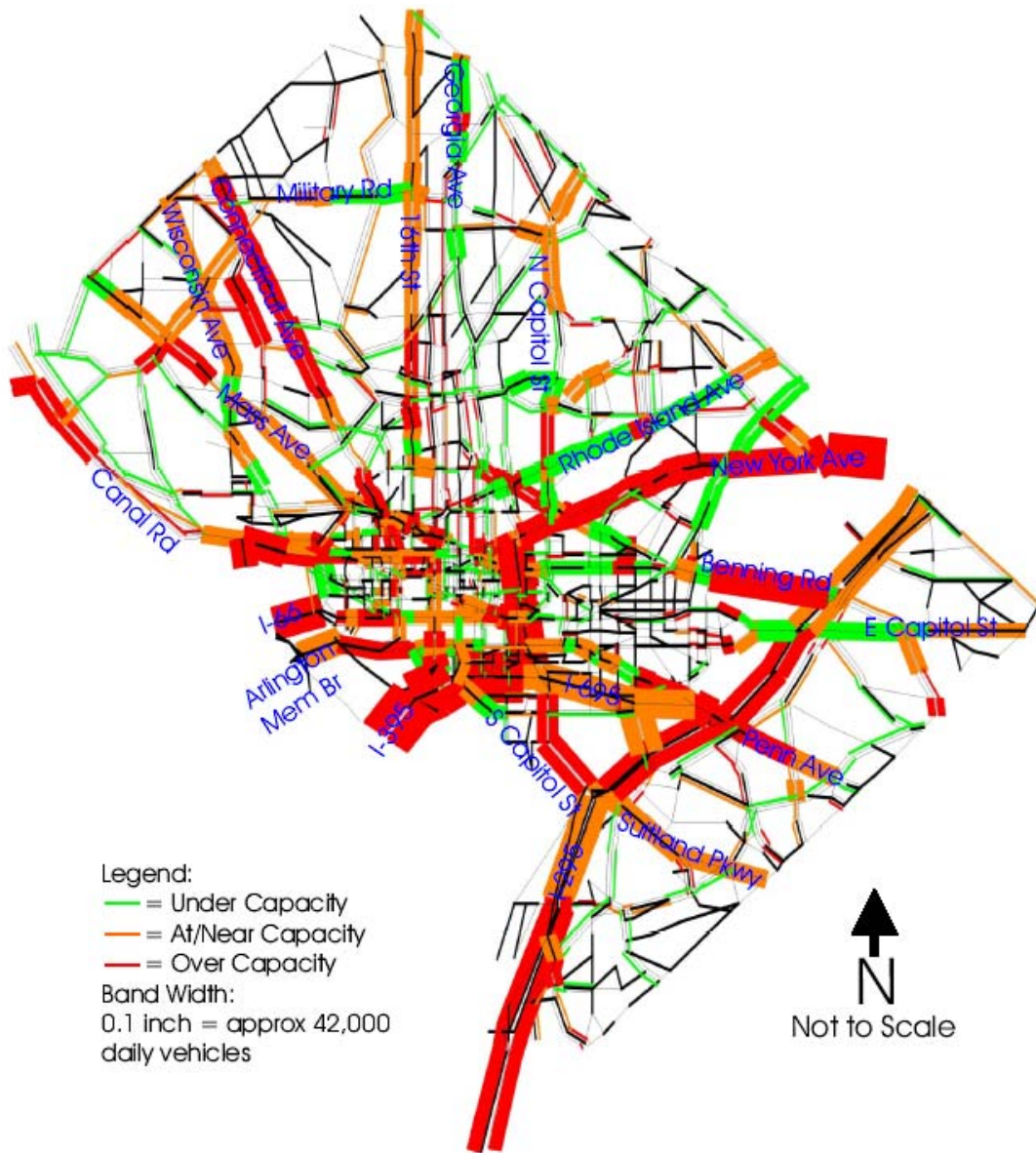


Exhibit 6
Year 2000 Roadway Traffic and Capacity

Exhibit 7
Major Roadways Operating Near or Over Capacity
(Planning-Level Analysis)

Roadway	From	To
7th Street and Georgia Avenue, NE	H Street	Rhode Island Avenue
13th Street, NW	R Street	U Street
13th Street, NW	Harvard Street	Spring Road
13th Street, NW	Arkansas Avenue	Piney Branch Road
14th Street, NW	F Street	Massachusetts Avenue
14th Street, NW	Monroe Street	Spring Road
14th Street, SW	Constitution Avenue	K Street
16th Street, NW	Scott Circle	Eastern Avenue
17th Street, NW	New York Avenue	F Street
23rd Street, NW	K Street	M Street
Alabama Ave, SE	Suitland Parkway	25th Street
Anacostia Freeway, SE	East Capitol Street	I-295
Beach Drive and Rock Creek Parkway, NW	Harvard Street Bridge	Broad Branch Road
Benning Road and Florida Avenue, NE	Anacostia Avenue	Southern Avenue
Branch Avenue, SE	Pennsylvania Avenue	Southern Avenue
Canal Road and Clara Barton Parkway, NW	M Street	DC Line
Connecticut Avenue, NW	Columbia Road	Chevy Chase Circle
Constitution Avenue, NW	17th Street	Virginia Avenue
East Capitol Street	22nd Street	B Street
Florida Avenue and Benning Road, NW	North Capitol Street	New York Avenue
Florida Avenue and Benning Road, NW	Georgia Avenue	6th Street, NW
Foxhall Road and MacArthur Boulevard, NW	MacArthur Boulevard	Canal Road
Georgia Avenue and 7th Street, NW	Arkansas Avenue	Kennedy Street
Georgia Avenue and 7th Street, NW	Aspen Street	Dahlia Stret
Good Hope Road, SE	Minnesota Avenue	Alabama Avenue
Anacostia Freeway, SE	Malcolm X Avenue	DC Line
Center Leg Freeway, SW & NW	DC Line	E Street
Independence Avenue, SE	South Capitol Street	Pennsylvania Avenue
Independence Avenue, SE	22nd Street, SE	East Capitol Street at 22nd Street
Independence Avenue, SW	South Capitol Street	1st Street, SW
K Street, NW	26th Street	27th Street
Kenilworth Avenue, NE	East Capitol Street	Benning Road
Kenilworth Avenue, NE	Benning Road	Eastern Avenue
L Street, NW	6th Street	7th Street
Massachusetts Avenue, NE	1st Street, NE	Stanton Square
Massachusetts Avenue, NW	4th Street	7th Street at Mount Vernon Place
Massachusetts Avenue, NW	15th Street	19th Street
Massachusetts Avenue, NW	22nd Street	Westmoreland Circle
Michigan Avenue, NE	North Capitol Street	Franklin Street
Michigan Avenue, NE	Monroe Street	McCormack Road
Michigan Avenue, NE	Perry Street	12th Street
Michigan Avenue, NE	13th Street	Eastern Avenue
Military Road and Missouri Avenue, NW	Georgia Avenue	41st Street
Minnesota Avenue, NE	East Capitol Street	Benning Road
Minnesota Avenue, SE	Pennsylvania Ave	East Capitol Street

Exhibit 7
**Major Roadways Operating Near or Over Capacity
 (Planning-Level Analysis)**

Roadway	From	To
Missouri Avenue, NW	North Capitol Street	Kansas Avenue
New Hampshire Avenue, NE	North Capitol Street	Eastern Avenue
New York Avenue, NE & NW	North Capitol Street	6th Street
North Capitol Street	M Street	Channing Street
North Capitol Street	Buchanan Street	Missouri Avenue
North Capitol Street	New Hampshire Avenue	Blair Road
Pennsylvania Avenue, NW	Peace Monument Circle	3rd Street
Pennsylvania Avenue, NW	4th Street	Constitution Avenue
Pennsylvania Avenue, NW	East End Bridge over Rock Creek Parkway	28th Street
Pennsylvania Avenue, NW	28th Street	M Street
Pennsylvania Avenue, SE	6th Street	Branch Avenue
Piney Branch Road, NW	Butternut Street	Eastern Avenue
Reno Road and 34th Street	Ordway Street	Albemarle Street
Reno Road and 34th Street	Fessenden Street	38th Street
Riggs Road, NE	Chillum Place	Eastern Avenue
South Capitol Street	Independence Avenue	MLK, Jr. Avenue near Xenia Street
South Capitol Street	Chesapeake Street	Galveston Street
South Dakota Avenue, NE	New York Ave	Bladensburg Road
U Street, NW	15th Street	16th Street
Wisconsin Avenue, NW	Q Street (South Intersection)	Calvert Street
Wisconsin Avenue, NW	Van Ness Street	41st Street
Wisconsin Avenue, NW	Fessenden Street	Jennifer Street
Chain Bridge		
Francis Scott Key Bridge		
Arlington Memorial Bridge		
Rocheambeau Bridge (I-395 HOV)		
Francis Case Memorial Bridge (I-395)		

Source: DDOT Traffic Counts, Parsons Transportation Group Planning-Level Analysis

The District's position as the center of the region is highlighted by transportation data collected by the U.S. Census. This information, included in a package called the Census Transportation Planning Package (CTPP), provides information on the flows of work trips between jurisdictions. Exhibit 8 shows, as percentages, where work trips destined for the District of Columbia originate and provides comparative data with 1990. Exhibit 9 shows where work trips originating in the District are destined, again in terms of percentages. Comparison data with 1990 is also included in each of these exhibits.

Exhibit 8
Origins of Work Trips Destined for the District

Origin Jurisdiction	1990	2000
District of Columbia DC	32.41%	28.37%
Prince George's Co. MD	19.38%	18.78%
Montgomery Co. MD	14.14%	14.84%
Fairfax Co. VA	12.94%	13.24%
Arlington Co. VA	6.00%	6.29%
Alexandria City VA	3.23%	3.47%
Prince William Co. VA	1.85%	2.29%
Anne Arundel Co. MD	1.64%	2.37%
Charles Co. MD	1.37%	1.61%
Howard Co. MD	1.08%	1.26%
Loudoun Co. VA	0.47%	0.87%
Calvert Co. MD	0.46%	0.59%
Baltimore City MD	0.43%	0.45%
Baltimore Co. MD	0.38%	0.55%
Frederick Co. MD	0.36%	0.45%
Stafford Co. VA	0.33%	0.49%
St. Mary's Co. MD	0.25%	0.27%
Falls Church City VA	0.23%	0.25%
Fairfax City VA	0.21%	0.24%
Spotsylvania Co. VA	0.19%	0.32%
Fauquier Co. VA	0.14%	0.17%
Manassas City VA	0.12%	0.13%
Washington Co. MD	0.08%	0.07%
Jefferson Co. WV	0.07%	0.09%
Carroll Co. MD	0.07%	0.11%
Queen Anne's Co. MD	0.06%	0.12%
Harford Co. MD	0.05%	0.07%
New York Co. NY	0.04%	0.05%
Warren Co. VA	0.04%	0.06%
Berkeley Co. WV	0.04%	0.07%
Fredericksburg City VA	0.04%	0.06%
Westmoreland Co. VA	0.04%	0.03%
Culpeper Co. VA	0.03%	0.04%
Caroline Co. VA	0.03%	0.03%
Other Maryland Jurisdictions	0.04%	0.08%
Other Virginia Jurisdictions	0.34%	0.51%
All West Virginia Jurisdictions	0.05%	0.04%
All Delaware Jurisdictions	0.03%	0.04%
All Other Jurisdictions	1.32%	1.25%

Source: United States 1990 and 2000 Census

Exhibit 9
Destinations of Work Trips Originating in the District

Destination Jurisdiction	1990	2000
District of Columbia DC	77.76%	73.05%
Montgomery Co. MD	6.73%	7.48%
Arlington Co. VA	4.40%	4.66%
Prince George's Co. MD	4.26%	5.23%
Fairfax Co. VA	3.10%	4.69%
Alexandria City VA	1.40%	1.55%
Anne Arundel Co. MD	0.23%	0.33%
Falls Church City VA	0.20%	0.14%
Baltimore City MD	0.17%	0.32%
Fairfax City VA	0.14%	0.17%
Howard Co. MD	0.13%	0.20%
Prince William Co. VA	0.13%	0.13%
Charles Co. MD	0.08%	0.11%
Loudoun Co. VA	0.08%	0.29%
New York Co. NY	0.07%	0.11%
Baltimore Co. MD	0.05%	0.15%
Other Maryland Jurisdictions	0.08%	0.16%
Other Virginia Jurisdictions	0.27%	0.34%
All West Virginia Jurisdictions	0.01%	0.02%
All Delaware Jurisdictions	0.01%	0.01%
All Other Jurisdictions	0.71%	0.87%

Source: United States 1990 and 2000 Census

In 2000, more than two-thirds of all persons who worked in the District resided outside of the District. In fact, twice the number of workers come from the five immediately adjacent jurisdictions of Montgomery County, Prince Georges County, Arlington County, Fairfax County, and Alexandria as come from the District (56.6 percent vs. 28.4 percent). The District plus these five jurisdictions account for 85 percent of all workers in Washington. About 7.5 percent of workers come from the next tier of jurisdictions, which include Prince William County in Virginia and Anne Arundel, Charles, and Howard Counties in Maryland.

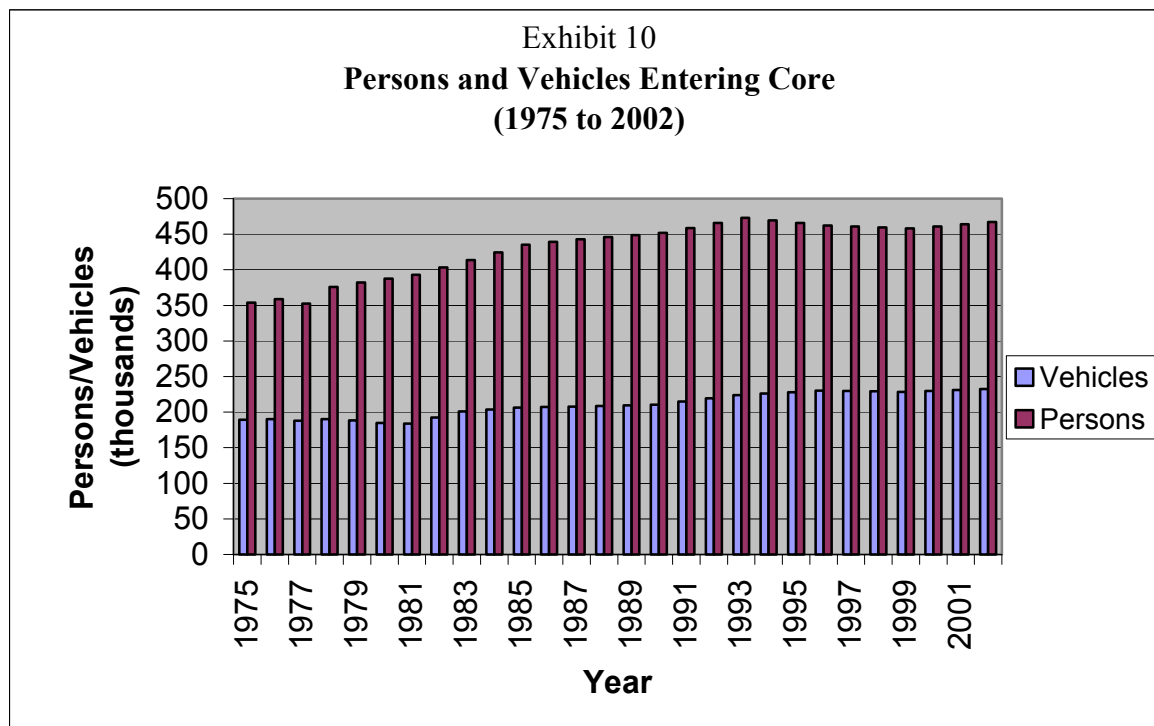
Conversely, most of the District's labor force (e.g. District residents with jobs) works in the District (73 percent in 2000). Another 24 percent of the District's labor force works in the five adjacent jurisdictions of Montgomery County, Prince Georges County, Arlington County, Fairfax County, and Alexandria. Less than 3.5 percent of the District's labor force works outside of the District or these inner jurisdictions.

Fewer people who worked in the District lived in the District in 2000 as compared to 1990. As a result of the decentralizing job market, almost all nearby jurisdictions

experienced higher percentages of District residents commuting out to them for work. The percentage of persons working in the District but residing elsewhere also increased more from Virginia jurisdictions than Maryland jurisdictions between 1990 and 2000. A decrease in the percentage of persons commuting from Prince Georges County to the District accounted from some of this.

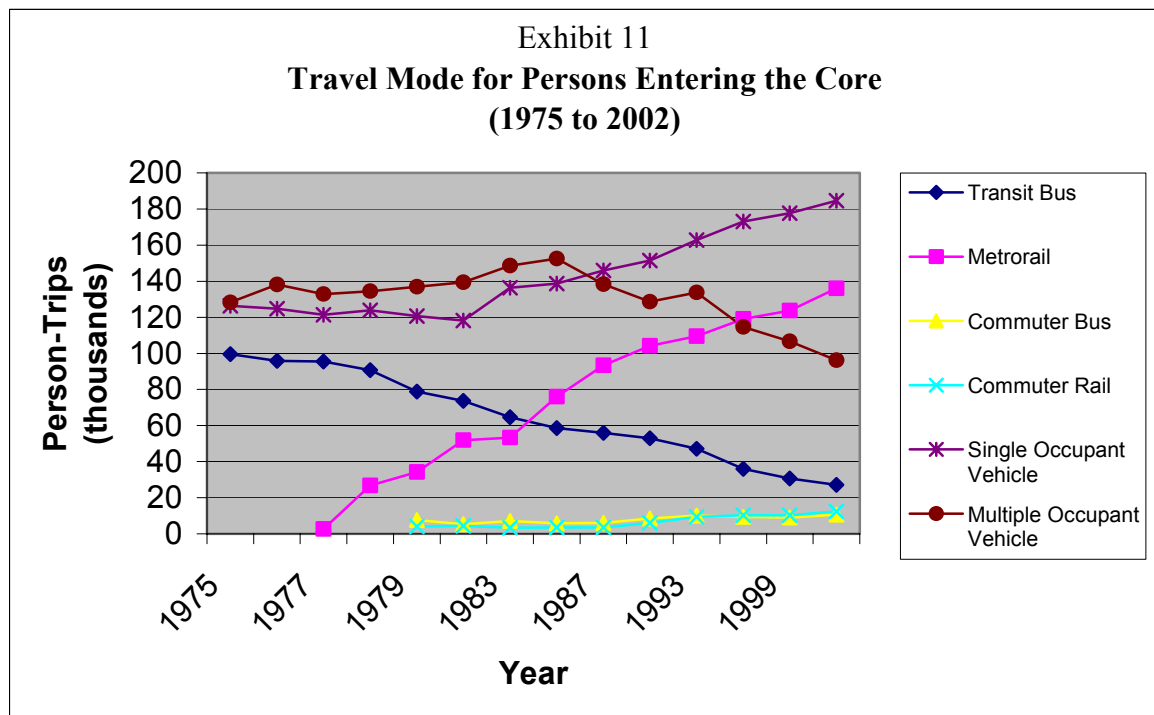
One of the best sources of information on long-term, “big-picture” changes in travel in and near the District of Columbia is from the Metro Core Cordon Counts and Surveys, which are performed by the Metropolitan Washington Council of Governments (MWCOC). These surveys have been performed every two or three years since 1975, with the most recent survey in the Spring of 2002. The intent of these surveys is to capture travel by all modes entering and exiting the area encompassed by the District’s monumental core and central business districts. The survey area also includes portions of Alexandria and Arlington encompassing the major activity centers of National Airport, the Pentagon, Crystal City, and Roslyn. Data is also collected at Potomac River bridge crossings. For most of this discussion, the data described is for the entire cordon including those portions of Virginia described above.

Since 1975, the number of people entering the core has increased by close to 32 percent, an average increase of about 1 percent per year. Over the same period, the number of vehicles (includes cars, trucks, buses, motorcycles, etc.) has increased by just under 23 percent, an average increase of 0.8 percent per year. This growth is shown in Exhibit 10.



Source: Metropolitan Washington Council of Governments, 2002 Metro Core Cordon Count

Exhibit 11 illustrates the travel mode changes for those entering the Washington region's core over the past 25 years. In 1975, travel into the core was relatively evenly split between those taking the bus (28 percent), driving alone (36 percent), or riding in a car with at least one other person (36 percent). Today, the share of those driving alone has increased slightly to 39 percent. The share of those using transit has increased substantially to just under 40 percent of all trips. Metrorail carries most of those riding transit (29 percent of all trips). Bus ridership decreased to about 6 percent of the total, with commuter bus and commuter rail carrying the remaining 5 percent. Rideshare also experienced a substantial decrease from 36 percent of all trips to about 21 percent



Source: Metropolitan Washington Council of Governments, 2002 Metro Core Cordon Count

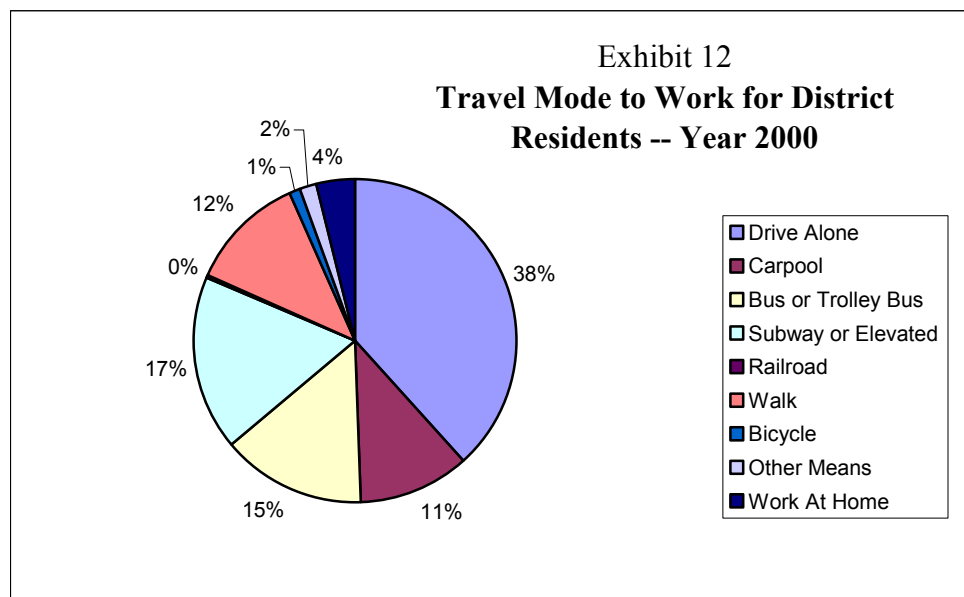
Prior to the most recent 2002 survey, MWCOG surveyed travel across the cordon line in 1999. Between 1999 and 2002, the 25-year trends essentially continued in terms of travel. Over this three-year period, when the District added 36,000 jobs and Arlington added 9,000 jobs, the number of person-trips and vehicles entering the cordon both increased at a rate of 0.6 percent per year. The number of persons riding Metrorail into the cordon increased by 10 percent over the 3-year period, while bus ridership decreased close to 12 percent. Commuter bus and rail ridership increased by 17 and 22 percent, respectively, and ridesharing continued to decrease.

While this increase in congestion has been more pronounced in suburban counties than in Washington, the District is still impacted by regional impacts such as air pollution and energy consumption. Despite its best efforts to promote transit use and develop a balanced transportation network, these external impacts do not stop at jurisdictional boundaries. Moreover, increased commute times in the region can create pressure on

employers to move out of the City and closer to the suburban workforce. Such trends make it even difficult for District residents to find work locally and may result in long reverse commutes for the urban labor force. Strategies to address this proactively are difficult to implement in the absence of a strong tradition of regional planning.

B. Increasing Transit Use / Opportunities for Transit-Oriented Development

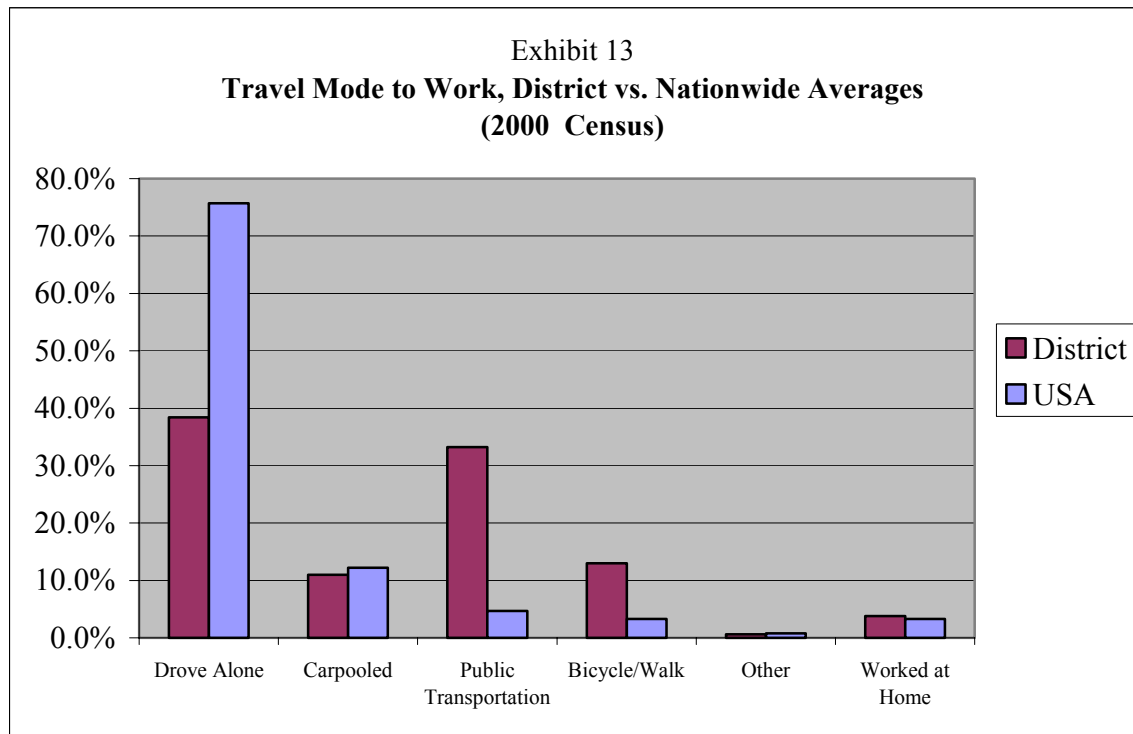
As measured by how people get to work, Washington has one of the most balanced transportation systems of all cities in the U.S. Exhibit 12 illustrates the breakdown by transportation mode to work reported by District residents in the 2000 Census (note that this is for District residents, not the Washington region as a whole). While driving alone to work is the largest category, 55 percent carpoolled, took the bus or subway, or walked.



Source: United States 2000 Census

Only New York has a lower percentage of residents driving alone to work. The District is also just behind New York in terms of the percentage of residents using public transportation as a whole and using subways in particular. The percentage of residents who walk to work is higher in Washington than New York, and is just below Boston's figure. Interestingly, Washington is more like West Coast cities like Portland, San Francisco, and Seattle in terms of the percentage of people who bicycle to work, and who work at home. Exhibit 13 provides a comparison of travel modes in the District versus national averages.

Travel mode to work varies with where in the District one lives. As one would expect, those living in less dense residential areas are more likely to drive and those living near existing Metrorail lines are much more likely to use public transportation. There is also a relationship between income and the percentage of travel by public transportation. Again, the city's most affluent areas register lower levels of public transit use than other areas of the city.



Source: United States 2000 Census

In 2001, 323 million trips in the Washington region were made on the WMATA-operated Metrobus and Metrorail systems. Approximately 55 percent of these trips were made on Metrorail. Between 1997 and 2001, passenger miles on the system grew by 21 percent, with Metrorail growing at about three times the rate of Metrobus. The average number of weekday transit trips grew at about 17 percent over the same period, with bus trips increasing by 14 percent and rail trips increasing by 18.5 percent.

The heavy reliance on transit creates two key opportunities. First, there is an opportunity to further capitalize on the investment that has been made in Metrorail by encouraging transit-oriented development around the Metro stations. Second, the strong tradition of using transit in the District bodes well for new travel modes, such as Bus Rapid Transit (BRT) and light rail. Some of the bus routes in the District carry high passenger volumes that are large enough to justify investment in new rail or BRT infrastructure.

C. Alterations to the System Resulting from Homeland Security Issues

Within the past five years, a number of changes to the District's transportation system have been made as a result of actions by the federal government in response to security concerns. Changes to the roadway system include:

- Pennsylvania Avenue NW was closed between 15th and 17th Streets
- E Street NW was closed between 15th and 17th Streets
- C Street NW was closed between 21st and 23rd Streets

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- H Street and I Street NW were converted to one way traffic
- 21st Street NW was made limited access between Virginia Avenue and Constitution Avenue
- Physical barriers have been put in to place to restrict traffic on First & Third Streets SE, and along Constitution and Independence Avenues to protect the U.S. Capitol.
- Closure of Pennsylvania Avenue between 15th and 17th Streets resulted in the need to re-route Metrobuses to H and I Streets NW
- Changes were made to the bus layover areas adjacent to the State Department in Potomac Park
- Metrobus service was removed from the Navy Yard, the Walter Reed Army Medical Center, Bolling Air Force Base, and the Defense Intelligence Agency Building.
- On-street parking was removed from the front of the following federal buildings:
 - Bureau of Alcohol Tobacco and Firearms Building – 7th Street NW
 - Federal Bureau of Investigation – Pennsylvania Avenue between 9th and 10th Streets NW
 - Federal Bureau of Investigation Building – H Street NW, on G Place NW
 - Main Justice Department Building – Constitution Avenue between 9th and 10th Streets NW
 - Coast Guard – 2nd Street NW
 - National Science Foundation – 20th Street NW
 - State Department – 2100 Block of C Street NW, 200 Block of 22nd Street NW, and 300 Block of 21st Street NW
 - U.S. Court of Appeals – Madison Street NW
 - New Executive Office Building – 1700 Block of 17th Street NW, and 1600 block of H Street NW
 - Federal Reserve System – C Street NW; 21st Street NW; 20th Street NW
 - Treasury Building – 14th and D Street SW
 - National Academy of Science – 21st Street NW

These changes have affected circulation in a way that was not anticipated by previous transportation plans and have exacerbated congestion, particularly in the heart of the City. The continued emphasis on national security will create an ongoing challenge to be reconciled as the District prepares future transportation plans.

D. Air Quality

The District of Columbia is considered a non-attainment area for ground level ozone by the US Environmental Protection Agency. This means that the federal one-hour standard for ground level ozone is exceeded in our air basin. The greatest exceedances typically occur on hot summer days. It is worth noting that, despite the non-attainment status, air pollution levels for all six criteria pollutants monitored by the EPA have actually improved since 1990.

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Poor air quality has been linked to poor health conditions in many US cities, including Washington, DC. Ozone can cause breathing problems in humans and animals, can damage vegetation, and can have secondary health effects such as chest pain, coughing, and nausea. It is a contributing factor to the relatively high number of childhood asthma cases in the District. The biggest contributor to ozone is vehicle emission.

Solutions to air quality problems in the Washington area are compounded by the fact that the metropolitan area includes three states and the District of Columbia. Even if the District does its fair share to promote alternatives to the automobile and environmentally responsible development, suburban travel patterns and land use decisions continue to counter the progress that is being made locally. Despite the fact that the District pays 40 percent of the cost of Metrorail, has the highest percentage of transit users, pedestrians, and cyclists in the region, and has the densest development patterns in the region, our transportation program is routinely jeopardized by our non-attainment status.

E. Rail Expansion

Expanding rail options will increase transportation capacity into and around the District. Several projects are underway or in advanced planning stages. They are:

- New York Avenue Metro Station. The District, in collaboration with the private sector and Federal government, is constructing the first “infill” metro station on the existing metro system. The station is slated to open in 2005 and will maximize transit accessibility to several major commercial developments and surrounding communities.
- 8-car Metro Trains. DC has budgeted to fund the expansion of Metro’s rail car capacity from 6 car trains to 8 car trains. This expansion will forestall the current system from reaching projected capacity in 2005.
- Downtown Circulator. To improve circulation in and around downtown and to discourage numerous automobile trips that tax the roadway, parking, and the environment, a Downtown Circulator bus service has been planned. This service would provide low cost, reliable transportation within the downtown area. Public/private collaboration continues toward finding appropriate funding.
- K Street NW, Bus Rapid Transit (BRT). Plans are underway to prioritize bus service along the K Street NW, corridor with dedicated bus rapid transit lanes. Further prioritization of existing bus routes will provide even more reliable and convenient improvements to District residents’ primary travel mode, the bus.
- Light Rail Transit – Anacostia Demonstration Project. DDOT has embarked on a community-based study to provide light rail transit and improve transit connections in and around the District of Columbia. Numerous routes have been studied with four high priority corridors emerging:
 - Anacostia Corridor/Minnesota Avenue to National Harbor (south of DC)
 - Silver Spring (MD) to Anacostia

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- Woodley Park to Stadium-Armory
- Georgetown to Stadium-Armory

The light rail will be initiated with a demonstration project in the existing rail right-of-way along the Anacostia corridor. The demonstration project will test the application of light rail technology while preserving a valuable transportation asset for the future. The approximate alignment of the light rail projects is shown in Exhibit 14. The exhibit shows the relationship of the light rail corridors to major development opportunity sites.

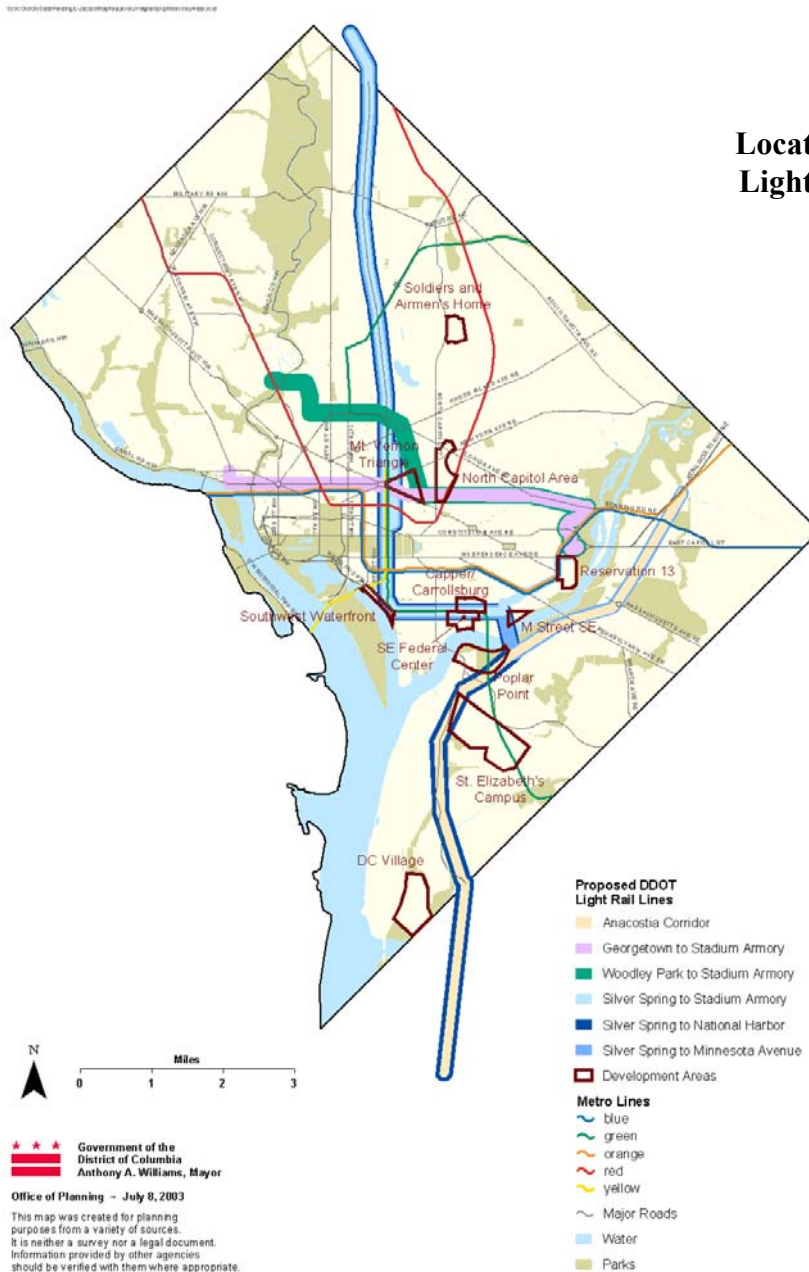


Exhibit 14
**Location of Proposed
Light Rail Corridors**

The light rail projects have the potential to significantly shape travel patterns in the District. They offer an opportunity to increase mobility for underserved communities, improve access between neighborhoods and job centers, and provide convenient cross-town connections that are currently lacking in both the roadway system and the Metrorail system. These projects also have the potential to significantly shape land use decisions during the next 20 years. They would create substantial new development opportunities along their alignments, particularly around station areas. In some cases, this would change the look and feel of neighborhood centers and corridor streets—in other cases, the alignments would mark a return to the “streetcar” development pattern that was present when the areas were initially developed.

F. Increasing Parking Shortages and Associated Tensions

The availability of parking is an issue in most large central cities and Washington is no exception. Much of the city’s housing stock and most of its commercial districts were constructed during an era when owning multiple vehicles was rare and the volume of commuter traffic was low.

DDOT has identified several areas in the city as having chronic parking shortages. Most are high-density urban neighborhoods with active neighborhood commercial streets and employment centers such as Georgetown, Adams Morgan, and Dupont Circle. An analysis by DDOT shows that the number of registered vehicles in these areas far exceeds the supply of parking spaces. Parking demand also exceeds supply near the city’s major tourist attractions and in much of the Central Employment Area. Many of the city’s outlying commercial centers were also built before contemporary parking standards were in place.

As surface parking lots have been (and will continue to be) replaced by new buildings in these areas, the supply of parking will diminish further—even as demand increases. Providing new parking lots or structured parking may benefit area merchants and improve consumer convenience but ultimately has the potential to generate additional traffic, alter neighborhood character, and reduce citywide efforts to promote other means of transportation such as transit and walking. Parking is also expensive. Its true cost is much greater than simply the cost of land.

Clearly parking issues will need to be addressed during the city’s Comprehensive Plan update. There are few issues that touch every DC resident and business like parking, and there are few areas in the city where the issue is not regularly debated. Parking is not merely about transportation—it is an integral part of the city’s dialogue about economic development, land use, neighborhood quality, and the environment.

3. TRANSPORTATION FUNDING

Between 1997 and 2002, the District of Columbia expended an annual average of \$377 million per year on its transportation system. The tables and charts in Exhibits 13-17 provide a breakdown of these expenditures. Over the six-year period, expenditures grew each year, with a total increase of 75 percent between 1997 and 2002.

As Exhibit 15 shows, most of the increase in expenditures went to rehabilitation and reconstruction, allowing the District to catch up on system maintenance needs that were deferred in the years prior to 1997. Exhibit 16 shows that half of all transportation expenditures in this six-year period were directed to rehabilitation, reconstruction, and replacement. Most of the remainder was expended on operations and maintenance.

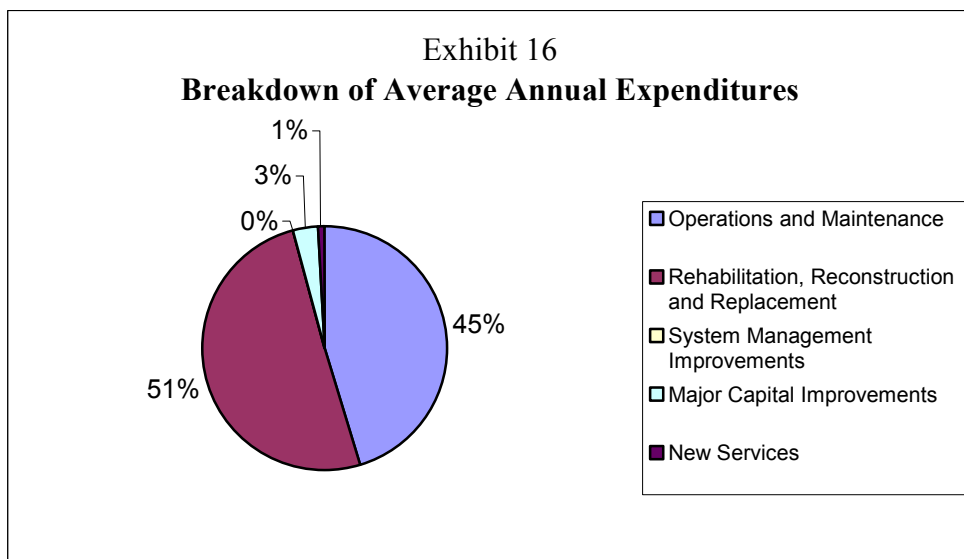
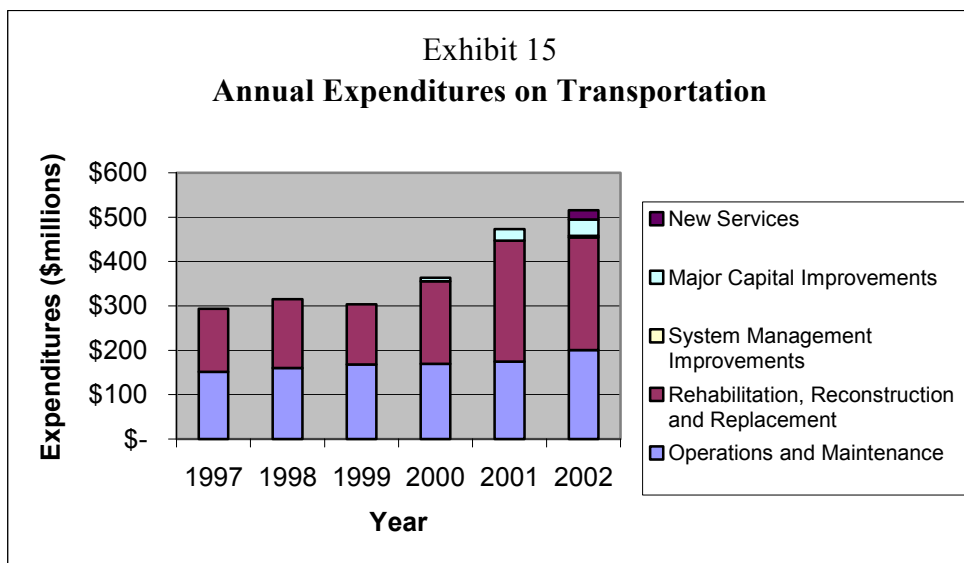


Exhibit 17 provides an additional breakdown of transportation expenditures for the six-year period. In terms of overall expenditures, approximately 54 percent of the funds were expended on street corridors (includes sidewalks and bicycle lanes) and bridges, and 46 percent were spent on transit. Exhibit 17 also highlights the fact that, because of the need for the District to catch up on system maintenance and preservation, there were no funds expended on major capital improvements until 2000. Expenditures in this category represent only 3 percent of the six-year total expenditures.

Exhibit 17
Annual Transportation Expenditures (\$ millions)

Category	1997	1998	1999	2000	2001	2002
Operations and Maintenance						
Streets and Highways	\$ 25	\$ 26	\$ 27	\$ 28	\$ 31	\$ 40
Pavement/Bridge Maintenance	\$ -	\$ 7	\$ 9	\$ 6	\$ 5	\$ 11
Transit	\$ 126	\$ 127	\$ 132	\$ 136	\$ 138	\$ 149
SUBTOTAL	\$ 151	\$ 160	\$ 168	\$ 169	\$ 175	\$ 200
Rehabilitation, Reconstruction and Replacement						
Streets, Highways and Bridges	\$ 92	\$ 115	\$ 124	\$ 173	\$ 255	\$ 235
Transit	\$ 50	\$ 40	\$ 12	\$ 14	\$ 17	\$ 20
SUBTOTAL	\$ 142	\$ 156	\$ 135	\$ 186	\$ 272	\$ 254
System Management Improvements						
Streets and Highways	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3
SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3
Major Capital Improvements						
Streets and Highways					\$ -	\$ 8
Transit	\$ -	\$ -	\$ -	\$ 8	\$ 26	\$ 29
SUBTOTAL	\$ -	\$ -	\$ -	\$ 8	\$ 26	\$ 37
New Services						
Streets and Highways	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21
SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21
TOTAL EXPENDITURES	\$ 294	\$ 315	\$ 304	\$ 363	\$ 473	\$ 516

Funding for transportation improvements and maintenance in the District of Columbia comes from a number of sources. Local sources include operating funds, capital maintenance trust funds, and general obligation bond funds. Additional sources include the DC Highway Trust Fund and federal funds. Exhibit 18 provides details on the various sources of funds for transportation over the six-year period from 1997 to 2002.

Exhibit 18
Transportation Funds

	1997	1998	1999	2000	2001	2002
Street Corridors						
Local Operating Budget	\$ 25	\$ 26	\$ 26	\$ 27	\$ 31	\$ 40
Local Capital Maintenance Trust Fund	\$ -	\$ -	\$ -	\$ -	\$ 7	\$ 23
Local General Obligation Bond Funds	\$ 12	\$ 27	\$ 16	\$ -	\$ 22	\$ 9
DC Highway Trust Fund	\$ 24	\$ 25	\$ 22	\$ 24	\$ 36	\$ 44
Federal-Aid Highway Program Apportionments	\$ 97	\$ 91	\$ 108	\$ 118	\$ 126	\$ 125
SUBTOTAL	\$ 158	\$ 169	\$ 171	\$ 169	\$ 222	\$ 240
Transit						
WMATA Operating Subsidy	\$ 126	\$ 127	\$ 132	\$ 136	\$ 138	\$ 149
WMATA Capital Budget	\$ 50	\$ 40	\$ 12	\$ 22	\$ 43	\$ 66
SUBTOTAL	\$ 176	\$ 168	\$ 144	\$ 158	\$ 182	\$ 214
TOTAL TRANSPORTATION FUNDS	\$ 334	\$ 336	\$ 315	\$ 326	\$ 404	\$ 455

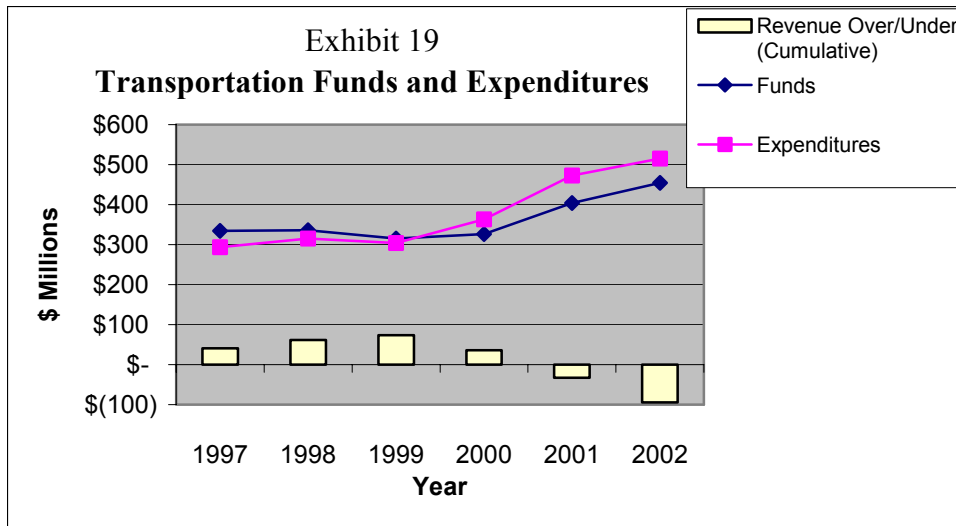
Exhibit 18 shows funds that are available for spending, while Exhibit 17 shows what was actually spent. Expending funds requires that staff and/or contractors are in place to perform the work and, in the case of federal funds, that local matching funds are available. During some years, therefore, expenditures were below available funding levels.

With some caveats, funds can be carried over to subsequent years. For example, during periods in the 1990s, DDOT (and its predecessor, the Department of Public Works) were not able to expend all available funds. As a result, a pool of unspent funds was available. This pool of unspent funds has allowed expenditures for the past few years to be at levels that are higher level than annual funding.

Exhibit 19 shows the relationship between transportation funds and expenditures during the six-year period from 1997 to 2002. The bar chart depicts the difference between funds and expenditures as a cumulative balance (the cumulative total starts in 1997 and does not include any balance prior to that year). As the chart shows, \$41 million of funds were not expended in 1997. By 1998, the unspent balance had grown to \$73 million.

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Since then, the District has been able to increase the rate at which it invests in the transportation infrastructure so the balance of unspent funds has decreased yearly.



4. FUTURE ANALYSIS AND STRATEGIES

DDOT is currently updating its 1997 Transportation Vision Plan and will be developing new transportation strategies through this process. The update is scheduled for completion in Winter 2003 and is being conducted through a collaborative process involving multiple agencies and the community at large. Some of the transportation strategies from the 1997 Plan may be carried forward, while new strategies may be added. Although strategies are still evolving, initial insights are shared here to better inform the Comprehensive Plan process.

The District's transportation network provides a competitive advantage in a dense urban setting. In most instances, the roadway network serves commercial and residential needs extremely well. The metro rail and bus systems complement the roadway system and maximize the daily flow of people across the city. However, the current network will continue to function adequately only if land use and transportation decisions are made in tandem and if additional funding sources are secured.

Several decades ago a transportation system similar to the current system served a city with 200,000 more residents than live in the city today. However, the urbanized area around Washington has more than doubled in population and quadrupled in land area since that time. Vehicle ownership rates have soared and commute patterns have placed great demands on an aging transportation network. Suburban land use patterns are more auto-dependent than the District's land use patterns, creating spillover effects that have pushed some District's roadways beyond capacity. If current growth patterns continue, the District's transportation network will not be able to meet projected demand. The combination of financial constraints, urban sprawl on the region's edges, and continued reliance on single passenger autos will overtax the existing system.

Future Analysis

Current projections show the District's population and employment each growing by about 25 percent between 2000 and 2030. How might this growth affect travel into and out of the District? How and by what modes would this travel be accommodated? While the transportation model developed by the Metropolitan Washington Council of Governments (MWCOC) provides tools for answering some of these questions, a separate analysis of the data and trends from MWCOC cordon counts, the US Census, and the Bureau of Labor Statistics provides some food for thought about potential District travel issues in the year 2030.

Exhibit 20 shows population, employment, and the number of persons and motor vehicles entering the region's central core during the morning commute. In 1975, the District had 710,000 residents and 576,500 jobs. In the same year, 354,000 people entered the region's core on a typical morning. By 2002, the District's population had declined to 571,000 and employment had risen to 663,200. During the morning commute, 467,000 people entered the core. In 1975, 0.6 people crossed in to the core for every job in the District. In 2003, this increased to about 0.7 people for every job in the District. In

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other words, a larger percentage of people commuted into the District in 2002 than in 1975.

Exhibit 20
Yearly Population and Cordon Crossing Estimates¹

Year	Population	Employment	Persons Entering Core	Vehicles Entering Core
1975	710,000	576,500	354,000	189,200
1976	696,000	575,800	358,800	190,400
1977	682,000	578,700	352,300	187,800
1978	670,000	596,300	375,700	190,300
1979	656,000	612,500	382,300	188,300
1980	638,432	616,100	387,750	184,900
1981	636,893	611,000	393,200	184,000
1982	634,174	597,900	403,350	192,500
1983	632,433	596,600	413,500	201,000
1984	633,382	613,800	424,450	203,800
1985	634,549	629,000	435,200	206,600
1986	638,269	640,000	439,100	207,200
1987	636,930	655,600	443,000	207,800
1988	630,432	672,600	445,900	208,700
1989	624,168	680,600	448,800	209,600
1990	606,900	686,000	451,700	210,500
1991	600,870	677,200	458,733	214,967
1992	597,565	673,600	465,767	219,433
1993	595,301	670,300	462,400	223,900
1994	589,239	658,700	469,333	225,967
1995	580,517	642,600	465,867	228,033
1996	572,377	623,000	462,400	230,100
1997	567,736	618,400	460,967	229,600
1998	565,230	613,500	459,533	229,100
1999	570,213	627,400	458,100	228,600
2000	572,059	650,200	461,067	229,867
2001	473,822	653,700	464,033	231,133
2002	570,898	663,200	467,000	232,400
2030	717,200	848,700		

¹ This table makes use of available data and therefore has several limitations. For instance, census data (for population) and BLS data (for employment) use different base years and are updated on different intervals. BLS employment estimates are somewhat lower than the estimates used by the Office of Planning. Moreover, the MWCOG cordon counts do not cover the entire District of Columbia, and define the "region's core" to include parts of Alexandria and Arlington. The data is extremely valuable, however, for comparing across years, since these limitations apply to all of the years analyzed.

Exhibit 20 and the discussion above illustrate another change in the District between 1975 and 2002. In 1975, there were 1.23 residents in the District for every job in the District. The decreasing population and increasing employment lines crossed in 1985-1986, when the two were approximately equal. Today, there are 0.86 residents for every job. While these differences are due to some extent to the increase in multi-worker households, more commuting from the suburbs across the core cordon is the primary factor.

Analysis of the data also indicates a relationship between the change in employment in the District and the number of persons crossing the cordon. Between 1975 and 2002, 0.9 additional persons crossed the cordon for every additional job created in the District. This provides a rough measure that can be used for planning purposes when estimating future travel demand.

A third piece in the travel puzzle is the mode by which people travel across the cordon line. Exhibit 21 compares the percentage travel by mode in 1975 and 2002. The major changes are the large decrease in persons using the bus (because of Metrorail construction) and the large decrease in percentage of persons carpooling.

Exhibit 21
Persons Entering Core by Mode

Mode	1975	2002
Transit Bus	28.1%	5.8%
Metrorail	0.0%	29.1%
Commuter Bus	0.0%	2.3%
Commuter Rail	0.0%	2.7%
Single Occupant Vehicle	35.7%	39.5%
Multi-Occupant Vehicle	36.2%	20.6%

By 2030, projections indicate the District will have 717,200 residents (one percent higher than the 1975 population) and 848,700 jobs (50 percent higher than 1975 employment). Using the rough relationship between jobs and persons entering the core, we would expect about 633,200 persons to cross the core cordon in 2030. This is an increase of 35 percent over existing numbers. Using these estimates, 0.75 people will be entering the core for every job located in the District.

Implementing programs that create a better geographic balance between jobs and housing could substantially reduce this number. For example, if we return to the 0.61 people entering per job that characterized 1975, the number of persons crossing the core cordon in 2030 would be 517,700 (a decrease of 18 percent from the projection cited above.)

Exhibit 22 shows how efforts to change the modes by which people enter the core could play out. Both 1975 and 2002 conditions are shown in this table for comparison purposes, along with the following three scenarios:

- Scenario 1: Persons entering the core would increase in direct proportion to increased jobs; mode split is the same in 2030 as it was in 2002.

- Scenario 2: A greater number of DC jobs would be held by DC residents. In other words, persons would enter the core at the same ratio of persons entering the core to jobs that existed in 1975. The same mode split as existed in 2002 is presumed.
- Scenario 3: A greater number of DC jobs would be held by DC residents, but modal split would change. Persons entering the core would be at the same ratio of persons entering the core to jobs that existed in 1975. A larger share of trips would be made by bus rapid transit and/or light rail.

Exhibit 22
Cordon Crossing Comparison Scenario

Mode	1975		2002		2030 Scenario 1		2030 Scenario 2		2030 Scenario 3	
	Percent	Volume	Percent	Volume	Percent	Volume	Percent	Volume	Percent	Volume
Transit Bus/Light Rail	28.1%	99,500	5.8%	27,100	5.8%	36,700	5.8%	30,000	15.0%	77,700
Metrorail	0	0	29.1%	136,100	29.1%	184,500	29.1%	150,900	27.0%	139,800
Commuter Bus	0	0	2.3%	10,600	2.3%	14,400	2.3%	11,800	4.0%	20,700
Commuter Rail	0	0	2.7%	12,400	2.7%	16,800	2.7%	13,700	4.0%	20,700
Single Occupant Vehicle	35.7%	126,300	39.5%	184,600	39.5%	250,300	39.5%	204,600	28.0%	145,000
Multit-Occupant Vehicle	36.2%	128,200	20.6%	96,200	20.6%	130,400	20.6%	106,600	22.0%	113,900

By any measure, Scenario 1 appears to be unreachable and undesirable. Increases of 36 percent in ridership during the morning commute on Metrorail are extremely unrealistic if not impossible. The quarter of a million single occupant vehicle travelers also represents an undesirable doubling of the number present in 1975. Scenario 2 presents a more realistic situation, with all modes increasing by about 10 percent. Scenario 3 highlights the need for transportation projects and policies to develop new travel modes. Both Scenarios 2 and 3 require companion strategies to better match DC residents to local jobs—and to add housing to provide the DC workforce with alternatives to commuting.

As it stands, Metrorail is already near capacity and cannot accommodate the increase to the levels depicted in Scenarios 2 and 3 without capital improvements (including 8-car trains). Capacity increases, along with additional capacity from new commuter bus and light rail service, could provide an opportunity to decrease single occupant vehicle levels back toward their 1975 levels.

The 1997 Transportation Vision

The 1997 Transportation Vision plan described a transportation system that:

- Allowed people, goods, and information to move efficiently and safely, with minimal adverse impacts on residents and the environment.

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- Was easy to use by everyone, from visitors to lifetime residents, regardless of the mode of travel.
- Was fun to use, appealing to tourists, and part of the City's ambiance.
- Integrated multiple modes, including autos, water, bicycles, and transit in a balanced way to link Washington DC to its gateways and destinations beyond.

A key part of this vision was to view transportation as an amenity to enhance the quality of life in the City, promote business development and entrepreneurship, and create tourism and entertainment opportunities.

Emerging Goals for the 2003 Transportation Vision

The 1997 Transportation Strategy identified six essential goals to guide resource allocation and project proposals. DDOT has identified possible modifications to these goals, resulting in the following preliminary list for the 2003 Vision Plan:

1. Maintain and improve the attractiveness and safety of the existing transportation system as a top transportation priority.
2. Focus transportation investments on internal circulation and the connections between various modes of travel in order to provide District residents and visitors with safe, appealing, and viable alternatives to the automobile.
3. Ensure that the District's transportation assets are being used to efficiently move people and goods while minimizing the negative impacts of this travel.
4. Develop a signature transportation system for the District that incorporates features such as light rail, water taxis, car sharing, and a world class bicycle and pedestrian network.
5. Promote business in the District by enhancing goods movement and delivery and by developing comprehensive curbside, alley, and parking management programs.
6. Ensure that the security needs of residents, visitors, government agencies, and businesses are served while preserving accessibility for the residents of the District and the region.
7. Enhance District and regional air quality by promoting efficient use of non-automotive modes of travel and encouraging the geographic proximity of housing, jobs, and services.
8. Reduce the negative impacts of transportation on District residents and ensure that transportation investments serve to enhance the District's neighborhoods as safe and attractive places to live.
9. Provide sufficient and consistent funding to sustain world class infrastructure by developing new revenue opportunities and innovative financing techniques.
10. Ensure that the project planning process includes all modes of travel from inception by improving coordination across agencies and institutions and by incorporating enhanced and continuous two-way communication with the public.

These goals provide the foundation for the emerging strategies listed in the next section. Many of these strategies originated in the 1997 Transportation Vision Plan but will need to be adjusted to reflect current conditions. Additional strategies to more strongly link transportation decisions to emerging land use plans have been suggested.

Emerging Strategies

Twelve emerging strategies are outlined below. These have not been yet endorsed by DDOT but are presented for further discussion.

Strategy 1: Improve Pedestrian and Bicycle Facilities

DDOT already employs pedestrian and bicycle coordinators charged with improving the reliability and safety of networks. The continued growth of these modes provides the best option to accommodate increased population while improving environmental conditions. A number of improvements (such as the Metropolitan Branch Trail) are already underway – more should be pursued in the future. The 1997 Transportation Vision Plan envisioned a “spine” of new routes that linked together existing routes and made crosstown bicycle travel more viable. The city’s bicycle plan is currently being updated to define these improvements. In addition, new pedestrian promenades, trails, and walkways should continue to be pursued to link neighborhoods to one another, improve access to open space, and make walking a safer and more viable alternative to the automobile.

Strategy 2: Provide New Modes and Travel Choices

The primary “new” mode being explored is actually not new at all. At one time, much of the city was crossed by streetcar lines. These lines shaped land use patterns, defined shopping districts, and provided a convenient means of travel for thousands of Washington residents and workers. As described earlier in this report, the City is now exploring the development of new light rail lines in four corridors.

Other travel modes and choices are also being tested and introduced. Maglev and high-speed intercity “bullet” trains have been explored in the past. Segways, rental (“zip”) cars, and shared cars are new choices that could improve travel in the District. Maximizing the benefits of these choices (faster pedestrian movement and decreased automobile ownership) would increase travel options and address some of the city’s capacity constraints. As other travel and technological advances reach the market they should be considered for integration into the transportation network.

Strategy 3: Promote Transit-Oriented Development Around Metro Stations and Along Proposed Light Rail Lines

Probably the best opportunity for linking land use and transportation is associated with Transit-Oriented Development around Metro stations. The District has not used land around its 39 Metro stations as efficiently as it could and is not fully capitalizing on the multi-billion dollar investment made in the Metrorail system. Some stations, such as Dupont Circle and Foggy Bottom, have become regional activity hubs and have very high volumes of arriving and departing traffic. Others, such as Deanwood and Congress Heights, have low passenger volumes and are surrounded by low density uses or

underutilized land. In some cases, zoning around transit stations does not support the density and intensity of development it might.

By using land around Metro stations more efficiently, the District has the opportunity to bring back some of its lost population, grow the tax base, reestablish safe and vibrant neighborhood centers, and decrease auto dependency and air pollution. By guiding growth toward these areas, the District can also utilize transit to improve mobility, employment, and recreational choices. It can direct development to locations where it is welcome, appropriate, and best accommodated.

Several Metro stations have emerged as particularly strong candidates for TOD. These include Takoma, Petworth, Columbia Heights, Shaw, Rhode Island Avenue, New York Avenue, Fort Totten, Potomac Avenue, and Tenleytown. Plans for Takoma and Shaw have recently been developed, and plans for Petworth and Tenleytown are being developed now. These plans identify rezoning actions, streetscape improvements, design guidelines, and other measures to facilitate TOD projects around each station.

Similar efforts should take place as light rail or BRT improvements are planned and implemented along Georgia Avenue, the Anacostia CSX corridor, and elsewhere. Integrated transportation and land use planning in these areas can improve the chances for successful, vital mixed use neighborhoods.

Strategy 4: Increase Transit Capacity

This strategy includes the use of 8-car trains on the Metrorail system (which DC has committed to funding), support for continued investment in the VRE and MARC commuter rail systems, the development of new transit modes such as light rail and BRT, and the expansion of the existing bus and paratransit system. As the analysis on the preceding pages indicates, expansion of transit capacity is essential to meet future travel demand without untenable congestion.

Strategy 5: Pursue a Jobs-Housing “Match” as well as a Jobs-Housing “Balance”

Despite the City’s best efforts to grow its economy and population at compatible rates, there is still a mismatch between the jobs being created and the skill level of the local labor force. As the data presented earlier in this report indicates, this has resulted in higher levels of workers commuting in to the District from the suburbs, and higher levels of DC residents commuting out to suburban employment centers.

A three-tiered strategy is needed to address this imbalance. First, additional housing is needed to attract persons working in DC but now living in the suburbs. Second, additional training and workforce development programs are needed to ensure that DC residents are suitably trained and prepared to fill the types of jobs being created in the city. Third, economic development programs are needed to create new jobs that recognize the varied skill levels of DC residents. The other white papers prepared as

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part of the Vision and Policy Framework (particularly the Economic Development paper) address these cross-cutting needs.

Strategy 6: Use Transportation Systems Management and Travel Demand Management (TSM/TDM) Tools to Improve Traffic Flow and Transit Service

This strategy entails a host of “smart transportation” measures designed to use the existing network as efficiently as possible. This includes such components as:

- The use of transportation signs that provide accurate real-time information on traffic conditions
- Information kiosks and signage improvements
- Real-time information on transit service and the availability of transfers
- Increasing bus reliability through technological improvements, improved routing, and construction enhancements that maximize roadway capacity
- Pricing strategies
- Ensuring that WMATA bus routes are designed to provide feeder service to Metrorail stations.

This strategy also includes travel demand management measures. As transportation capacity becomes a scarcer commodity, options for prioritizing its use need to be investigated and implemented. Congestion pricing is one way to regulate the use of a limited resource and perhaps achieve a particular outcome (such as increased transit use). Care must be taken, however, to ensure that such strategies do not adversely affect the poor and others with special transportation needs.

Strategy 7: Anticipate the Transportation Needs of New and Emerging Development Areas.

The Mayor’s stated policy of attracting 100,000 new residents has significant implications for transportation demand. The city has already identified probable sites where new residents might be accommodated. Thus, there is already a general idea of where additional vehicle and transit trips will originate. Transportation plans to accommodate these trips should be developed now rather than later. Conceivably, the City could use road and transit improvements as an incentive for development and private investment in these areas. Given the current fiscal situation, however, the more likely scenario will be measures to ensure that the private sector mitigates transportation demand by paying their fair share of development-related improvements.

Employment growth will also generate new transportation needs. During the coming years, proactive measures will be needed to anticipate and respond to the need for road improvements, parking, transit improvements, and new bicycle and pedestrian facilities in the Near Southeast, the Southwest Waterfront, South Capitol Gateway, and other emerging job centers. Such measures should incorporate the overarching goal of decreasing the percentage of trips made by single passenger auto, in order to further regional air quality goals.

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Strategy 8: Provide Additional Parking at Strategic Locations Linked to Transit and Other Non-Automobile Travel Modes

This was a key strategy in the 1997 Plan. *It is not yet known whether it will be carried forward into the 2004 Plan.*

Such parking areas would enable travelers to the District to park once, and then transfer to other modes such as buses, trolleys, or Metrorail. This would reduce some of the travel demand within the central core and could alleviate congestion in areas of heavy tourist traffic.

Strategy 9: Promote the development of multi-modal corridors

This was a key strategy in the 1997 Plan. *It is not yet known whether it will be carried forward into the 2004 Plan.*

The strategy suggested that a number of major corridors be redesigned to accommodate multiple modes of travel. This would entail adding bus bypass lanes, signal pre-emption technology (to give buses priority), new bicycle and new pedestrian facilities, new transit options, and enhanced pavement and landscaping amenities. The selected corridors could become logical places for new development such as higher density housing, hotels, and mixed use office/retail projects. One constraint to implementing this strategy is that the street system of the historic city is a national historic landmark and may be difficult to modify. Moreover, street widths in the city are generally fixed and may be difficult to reconfigure without losing curbside parking.

Strategy 10: Promote Transportation as a Visitor Amenity

This was a key strategy in the 1997 Plan. *It is not yet known whether it will be carried forward to the 2004 Plan.* The idea was to make transportation part of the visitor “experience” for the 20 million tourists a year that visit Washington.

The City already has a network of water taxis and watercraft, and its Metrorail system is a signature feature serving millions of visitors a year. The network of streetcars and bike paths now being contemplated could be potential amenities for visitors. This may have implications for the light rail system’s alignment and the design of stations and rolling stock. The use of antique streetcars like those used in San Francisco and New Orleans could create a new attraction that not only provides mobility but also helps tourists venture into Washington “beyond the Mall.” Similarly, the terminus of such lines could provide opportunities for new retail/service development. Union Station already serves such a function, and is arguably more popular among tourists than it is among residents and the nearby workforce.

Strategy 11: Link Road and Bridge Reconstruction to Other Strategic Investment Programs and Neighborhood Planning Initiatives

The reconstruction of bridges and roads provides an opportunity to achieve other neighborhood planning objectives. Bridge replacement could provide an opportunity to reconfigure approaches and landings and reduce negative impacts on nearby communities. Such projects also provide opportunities for aesthetic improvements, new landmarks and image-defining features, and enhanced recreational access to waterfront open space. Similarly, rebuilding of roadways can provide opportunities to eliminate barriers to pedestrian movement, improve safety, increase road capacity, address parking deficiencies, and beautify the cityscape. These opportunities should not be squandered, and should be done in concert with other City initiatives to strategically invest in District neighborhoods.

The flip side of this issue is that transportation infrastructure may create barriers to neighborhood revitalization in some parts of the city. For instance, an elevated rail line in Southwest DC has long been an obstacle in efforts to improve and unify that area. Similar barriers exist along both sides of the Anacostia River, where freeways and/or rail lines hug the shoreline. Creative ways to bridge these barriers will continue to be needed in the future.

Strategy 12: Reduce Trucking Conflicts by Developing Rail, Intermodal Facilities, and Improved Truck Routes

This strategy from the 1997 Transportation Vision Plan responded to economic development goals as well as conflicts between truck traffic and residential traffic, “wear and tear” issues, and environmental quality issues. The approach recommended by the 1997 Plan was threefold: (1) removing trucks from the roadway system by promoting rail as an alternative, with intermodal facilities sited to intercept goods and divert them to smaller trucks; (2) accommodating goods delivery by increasing loading zone and commercial parking areas; and (3) minimizing the impacts of trucks by improving a number of key roadways. If the District continues this strategy, a suitable location for an intermodal facility would need to be identified. Ideally, such a facility would be located near the junction of a major rail line and freeway entrance.

Overarching all 12 of these strategies, the relationship between the city’s land use objectives (revitalized neighborhoods, walkable centers, etc.) and its transportation services and systems must remain at the forefront of the city’s transportation planning programs. Travel demand is directly related to land use type and intensity. And the way we respond to that demand will shape land use decisions for years to come.

A Final Note About Funding

Specific strategies to increase funding are not on the above list, but clearly overarch all others. Such strategies are needed for the safety and well being of District residents and the health of the local economy. The 1997 Vision Plan suggested that an independent

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regional funding source be developed for WMATA and that increased flexibility be provided in the use of Federal-aid funds. It also suggested expanding the Transportation Trust Fund. Given the heavy use of the District's transportation system by federal interests and regional commuters, increased federal and regional participation in funding is not only appropriate and equitable—it is essential.